

## WHAT IS CLAIMED IS:

1. A method for producing a device for the transport of fluids through a biological barrier, the method comprising:

- (a) providing a substrate having first and second parallel outward-facing surfaces;
- (b) processing said substrate so as to form a plurality of bores extending into said substrate from said first surface, each of said bores being substantially symmetrical about a central bore-axis; and
- (c) processing said substrate so as to remove at least part of said second surface in such a manner as to leave a plurality of conical projections projecting from a remaining thickness of said substrate, each of said conical projections being substantially symmetrical about a central cone-axis,

wherein said bores and said conical projections are configured such that each of said bores intersects an external surface of a corresponding one of said conical projections, said bore-axis and said cone-axis being non-coincident.

2. The method of claim 1, wherein each of said conical projections terminates at an apex, each of said bores being configured to intersect said corresponding conical projection without removing said apex.

3. The method of claim 1, further comprising depositing a layer of metallic material over at least said conical projections.

4. The method of claim 1, further comprising depositing a layer of a super-elastic alloy over at least said conical projections.

5. The method of claim 4, further comprising removing material of said substrate from within said layer of super-elastic alloy so as to leave conical projections formed substantially exclusively from said layer of a super-elastic alloy.

6. A method for producing a device for the transport of fluids through a biological barrier, the method comprising:

- (a) providing a substrate;
- (b) processing said substrate so as to form a plurality of hollow microneedles projecting from a remaining thickness of said substrate, each of said hollow microneedles being substantially symmetrical about a central needle-axis; and
- (c) eroding part of said hollow microneedles in a manner asymmetric with respect to said needle-axis so as to form beveled-ended hollow microneedles.

7. The method of claim 6, wherein said eroding is performed by ion milling.

8. The method of claim 6, wherein said eroding is performed by sand blasting.

9. The method of claim 6, further comprising depositing a layer of metallic material over at least said beveled-ended hollow microneedles.

10. The method of claim 6, further comprising depositing a layer of a super-elastic alloy over at least said beveled-ended hollow microneedles.

11. The method of claim 10, further comprising removing material of said substrate from within said layer of super-elastic alloy so as to leave beveled-ended hollow microneedles formed substantially exclusively from said layer of a super-elastic alloy.

12. A device for the transport of fluids through a biological barrier, the device comprising:

- (a) a substrate having a front surface provided with an array of outwardly projecting microneedles for penetrating into the biological barrier, said microneedles having a maximum width dimension of no more than about 400  $\mu\text{m}$  and a maximum height dimension of no more than about 2 mm, said substrate being formed with a plurality of fluid flow channels associated with said microneedles;

- (b) at least one element cooperating with said substrate to form a structure including a variable volume fluid pumping cell having a variable internal volume in fluid connection with said plurality of fluid flow channels; and
- (c) at least a first one-way valve mounted on a rear surface of said substrate and deployed so as to overlie an opening to at least one of said fluid flow channels for controlling fluid flow from said internal volume to said microneedles,

such that, when the device is deployed with said microneedles penetrating into the biological barrier, a change in said internal volume of said pumping cell results in fluid transfer between said internal volume and said microneedles via said fluid flow channels.